

What is claimed is:

1. Apparatus for use in a fluid processing system having a pump, the apparatus comprising:
  - 5 a pump cassette for use with the pump, the pump cassette including at least one pump chamber and a first port in selective fluid communication with the at least one pump chamber; and
  - a mechanically operated spiking assembly including at least one hollow spike having a piercing end for piercing a first container, the at least
  - 10 one hollow spike including a first spike in fluid communication with the first port of the pump cassette.
2. Apparatus according to claim 1, further comprising:
  - first tubing coupled at one end to the first port of the pump cassette
  - 15 and at another end to a non-piercing end of the first spike so as to provide a first fluid path between the first port and the first spike.
3. Apparatus according to claim 1, wherein the first port is a fluid outlet port, and wherein the first spike provides a fluid inlet to the first container.
- 20 4. Apparatus according to claim 1, wherein the first port is a fluid inlet port, and wherein the first spike provides a fluid outlet from the first container.
- 25 5. Apparatus according to claim 1, wherein the spiking assembly includes a housing.
6. Apparatus according to claim 5, wherein the housing comprises two substantially identical halves that are joined together.

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7. Apparatus according to claim 5, wherein the spiking assembly further includes a spike holder captured by the housing, the spike holder engaging the at least one spike.
- 5 8. Apparatus according to claim 7, wherein the spike holder is overmolded onto the at least one spike.
9. Apparatus according to claim 8, wherein the overmolded spike holder includes, for each spike, a tubing barb proximate to the non-piercing end of  
10 the spike for coupling a tube to the spike.
10. Apparatus according to claim 9, wherein the housing includes at least one element for engaging each tube about the tubing barb so as to secure the tubes within the housing.
- 15 11. Apparatus according to claim 5, wherein the spiking assembly includes a spike guard disposed within the housing and overlaying the piercing end of the at least one spike.
- 20 12. Apparatus according to claim 11, wherein the spike guard includes a grommet capable of being pierced by the at least one spike.
13. Apparatus according to claim 12, wherein the grommet functions as a fluid seal when in contact with the first container.
- 25 14. Apparatus according to claim 11, wherein the spike guard includes at least one tab for engaging one or more slots in the housing to prevent movement of the spike guard, the at least one tab capable of being disengaged from the one or more slots to allow movement of the spike guard towards the  
30 at least one spike such that the at least one spike can pierce the grommet.

15. Apparatus according to claim 5, wherein the housing includes at least one element for engaging a container holder.
16. Apparatus according to claim 15, wherein the at least one element  
5 includes a surface forming an undercut for engaging at least one corresponding feature on the container holder.
17. Apparatus according to claim 1, wherein the at least one spike includes a second spike.
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18. Apparatus according to claim 17, further comprising:  
a second container; and  
second tubing coupled at one end to a non-piercing end of the second spike and at another end to the second container so as to provide a second  
15 fluid path between the second spike and the second container.
19. Apparatus according to claim 18, further comprising:  
a filter coupled between the second spike and the fluid receptacle along the second fluid path.
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20. Apparatus according to claim 1, wherein the pump cassette includes a second port in selective fluid communication with the at least one pump chamber.
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21. Apparatus according to claim 20, further comprising:  
third tubing coupled at one end to the second port, the third tubing providing a third fluid path between the second port and a third container.
22. Apparatus according to claim 21, further comprising:  
30 a third spike coupled to another end of the third tubing for piercing the third container.

23. Apparatus according to claim 20, wherein the at least one pump chamber includes two pump chambers, and wherein fluid can be pumped from one port into one pump chamber while fluid is pumped from the other pump chamber out the other port.
24. Apparatus according to claim 1, wherein the pump cassette is pneumatically controlled by the pump.
25. Apparatus for use in a fluid processing system having a pump, the apparatus comprising:  
a pump cassette for use with the pump, the pump cassette including at least one pump chamber and a first port in selective fluid communication with the at least one pump chamber; and  
a spiking assembly including a plurality of hollow spikes, each having a piercing end for piercing a first container, the plurality hollow spikes including a first spike in fluid communication with the first port of the pump cassette.
26. Apparatus according to claim 25, further comprising:  
first tubing coupled at one end to the first port of the pump cassette and at another end to a non-piercing end of the first spike so as to provide a first fluid path between the first port and the first spike.
27. Apparatus according to claim 25, wherein the first port is a fluid outlet port, and wherein the first spike provides a fluid inlet to the first container.
28. Apparatus according to claim 25, wherein the first port is a fluid inlet port, and wherein the first spike provides a fluid outlet from the first container.

29. Apparatus according to claim 25, wherein the spiking assembly includes a housing.

30. Apparatus according to claim 29, wherein the housing comprises two substantially identical halves that are joined together.

31. Apparatus according to claim 29, wherein the spiking assembly further includes a spike holder captured by the housing, the spike holder engaging the at least one spike.

32. Apparatus according to claim 31, wherein the spike holder is overmolded onto the plurality of spikes.

33. Apparatus according to claim 32, wherein the overmolded spike holder includes, for each spike, a tubing barb proximate to the non-piercing end of the spike for coupling a tube to the spike.

34. Apparatus according to claim 33, wherein the housing includes at least one element for engaging each tube about the tubing barb so as to secure the tubes within the housing.

35. Apparatus according to claim 29, wherein the spiking assembly includes a spike guard disposed within the housing and overlaying the piercing end of the plurality of spikes.

36. Apparatus according to claim 35, wherein the spike guard includes a grommet capable of being pierced by the plurality of spikes.

37. Apparatus according to claim 36, wherein the grommet functions as a fluid seal when in contact with the first container.

38. Apparatus according to claim 35, wherein the spike guard includes at least one tab for engaging one or more slots in the housing to prevent movement of the spike guard, the at least one tab capable of being disengaged from the one or more slots to allow movement of the spike guard towards the plurality of spikes such that the plurality of spikes can pierce the grommet.

39. Apparatus according to claim 29, wherein the housing includes at least one element for engaging a container holder.

40. Apparatus according to claim 39, wherein the at least one element includes a surface forming an undercut for engaging at least one corresponding feature on the container holder.

41. Apparatus according to claim 25, wherein the plurality of spikes includes a second spike.

42. Apparatus according to claim 41, further comprising:  
a second container; and  
second tubing coupled at one end to a non-piercing end of the second spike and at another end to the second container so as to provide a second fluid path between the second spike and the second container.

43. Apparatus according to claim 42, further comprising:  
a filter coupled between the second spike and the fluid receptacle along the second fluid path.

44. Apparatus according to claim 25, wherein the pump cassette includes a second port in selective fluid communication with the at least one pump chamber.

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45. Apparatus according to claim 44, further comprising:

third tubing coupled at one end to the second port, the third tubing providing a third fluid path between the second port and a third container.

46. Apparatus according to claim 45, further comprising:

5 a third spike coupled to another end of the third tubing for piercing the third container.

47. Apparatus according to claim 44, wherein the at least one pump

chamber includes two pump chambers, and wherein fluid can be pumped  
10 from one port into one pump chamber while fluid is pumped from the other pump chamber out the other port.

48. Apparatus according to claim 25, wherein the pump cassette is pneumatically controlled by the pump.

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49. Apparatus for piercing a container, the apparatus comprising:  
a housing;

a spike holder captured by the housing, the spike holder engaging at least one hollow spike having a piercing end for piercing the container; and

20 a spike guard disposed within the housing and overlaying the piercing end of the at least one spike.

50. Apparatus according to claim 49, wherein the spike guard includes a grommet capable of being pierced by the at least one spike

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51. Apparatus according to claim 50, wherein the grommet functions as a fluid seal when in contact with the container.

52. Apparatus according to claim 49, wherein the at least one hollow spike

30 includes a first spike for providing a fluid inlet to the container.

53. Apparatus according to claim 49, wherein the housing comprises two substantially identical halves that are joined together.

54. Apparatus according to claim 49, wherein the spike holder is  
5 overmolded onto the at least one spike.

55. Apparatus according to claim 54, wherein the overmolded spike holder includes, for each spike, a tubing barb proximate to the non-piercing end of the spike for coupling a tube to the spike.  
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56. Apparatus according to claim 55, wherein the housing includes at least one element for engaging each tube about the tubing barb so as to secure the tubes within the housing.

57. Apparatus according to claim 49, wherein the spike guard includes at least one tab for engaging one or more slots in the housing to prevent movement of the spike guard, the at least one tab capable of being disengaged from the one or more slots to allow movement of the spike guard towards the at least one spike such that the at least one spike can pierce the grommet.  
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58. Apparatus according to claim 49, wherein the housing includes at least one element for engaging a container holder.  
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59. Apparatus according to claim 58, wherein the at least one element includes a surface forming an undercut for engaging at least one  
25 corresponding feature on the container holder.

60. Apparatus according to claim 49, wherein the at least one spike includes a second spike for providing an outlet from the container.

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61. A kit comprising:



a pump cassette for use with a pump, the pump cassette including at least one pump chamber and a first port in selective fluid communication with the at least one pump chamber;

5 a spiking assembly including at least one hollow spike having a piercing end for piercing a first container; and

first tubing for connection at one end to the fluid outlet port of the pump cassette and at another end to a non-piercing end of a first spike for providing a first fluid path between the first port and the first spike.

10 62. A kit according to claim 61, wherein the at least one spike further includes a second spike.

63. A kit according to claim 62, further comprising:  
a second container; and

15 second tubing for connection at one end to a non-piercing end of the second spike and at another end to the second container for providing a second fluid path between the second spike and the second container.

64. A kit according to claim 63, further comprising:  
20 a filter for connection between the second spike and the second container along the second fluid path.

65. A kit according to claim 61, further comprising:  
third tubing for connection at one end to a fluid inlet port of the pump  
25 cassette.

66. A kit according to claim 65, further comprising:  
a third spike coupled to another end of the third tubing for piercing a  
third container.

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67. A method for attaching tubing to one or more spikes of a spiking assembly, the method comprising:

- overmolding a spike holder over a portion of each of the spikes such that each spike maintains a substantially fixed position within the spike holder and at least one barb is formed proximate to each spike; and  
5 attaching a tube to each spike, each tube installed over one of the barbs.

68. A method according to claim 67, further comprising:

- capturing the tubing within a housing, wherein the housing includes at least one element for engaging the tubing about the barbs so as to secure the tubes within the housing.  
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69. Apparatus for use in a fluid processing system having a pump, the apparatus comprising:

- 15 a pump cassette for use with the pump, the pump cassette including at least one pump chamber and a first port in selective fluid communication with the at least one pump chamber; and  
a spiking assembly including a spike, the spike having at least two fluid channels, at least one of the fluid channels in fluid communication with  
20 the first port of the pump cassette.